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CAREER AREA ROTATION MODEL (CAROM): HISTORICAL OVERVIEW OF TECH--ETC(U)
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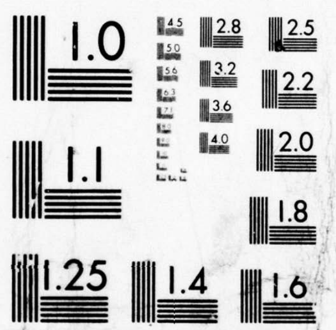
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CAREER AREA ROTATION MODEL (CAROM): HISTORICAL OVERVIEW OF TECHNIQUE AND UTILIZATION

By

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NOTICE

This final report was submitted by Occupation and Manpower Research Division, under project 2077, with HQ Air Force Human Resources Laboratory (AFSC), Brooks Air Force Base, Texas 78235. Mr. Larry T. Looper (ORS) was the Principal Investigator for the Laboratory.

This technical report has been reviewed and is approved for publication.

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This report provides a management overview of the Career Area Rotation Model (CAROM) and reviews the utilization of the model as an aid in the formulation of personnel policy.

The objectives of this study were twofold. First, a review of the development of CAROM was made along with an overview intended for personnel and manpower managers. The second purpose was to discuss how the model could be used in actual decision-making situations through the presentation of two previous applications. One application involved the analysis on the enlisted force in several career fields of alternative promotion systems. The other application was concerned with studying CONUS rotation base problems brought about by varying overseas tour lengths. In both applications, it was seen that CAROM provided considerable relevant information to the personnel policy decision process.

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CAREER AREA ROTATION MODEL (CAROM): HISTORICAL OVERVIEW OF TECHNIQUE AND UTILIZATION

I. INTRODUCTION

For a number of years, the Air Force Human Resources Laboratory (AFHRL) has been involved with the design, development, and utilization of manpower and personnel decision and simulation models. Such models have ranged along a continuum from simple one or two variable operational decision models to complex, computerized simulation models of large segments of the Air Force manpower and personnel system. One such model of the latter type is the Career Area Rotation Model (CAROM). This particular model is part of a logical flow of model development, by AFHRL, which is attempting to mathematically capture the interactions and interrelationships among manpower and personnel system variables and parameters. CAROM has been utilized by several Air Force activities and has been modified to adapt to a changing policy environment and to be aligned with current personnel policy.

Although two previously published technical reports (Hughes, 1975; Williams, Looper, & Morton, 1973) discuss in detail the operational characteristics of the model, neither discusses the utilization of CAROM and the model's relationship to the present and planned inventory of manpower and personnel simulation models available to AFHRL. This present effort discusses the historical development of CAROM, including modifications and enhancements, reviews the model's relationship to other AFHRL-developed modeling products, presents the purpose of CAROM with a management-oriented description of the model, and finally, reviews two previous uses that have been made of CAROM.

II. HISTORICAL DEVELOPMENT OF CAROM

The initial efforts toward development of CAROM began in 1969, and the model began taking firm shape following conferences between representatives of AFHRL and the Air Force Military Personnel Center [now known as the Air Force Manpower and Personnel Center (AFMPC)]. A statement of work was initiated and requests for proposals were sent out in that year. Decision Systems Associates, Inc. (DSAI) was awarded the contract in 1970 for development of the model.

The preliminary design for the model called for a much simpler version than was finally delivered to AFHRL late in 1973. The lengthy development time for the model was caused by two factors. First, the model underwent a number of changes before it was finalized for programming, and even after programming had begun, changes were initiated to make the model more in accord with current Air Force personnel policy. One of the major changes was the addition of the Weighted Airman Promotion System (WAPS) to the model, which enabled it to simulate the present promotion selection methodology for enlisted grades. A second major change was the incorporation of skill level information for assignment purposes. Early versions of CAROM used grade and tour only for assignment categories. Both of these changes together caused an enhancement of the original contractual effort. An additional factor in the long development time was the changeover of the AFHRL computer during the model design and programming period.

Shortly before the end of the contractual period, Request for Personnel Research (RPR) 73–14, "Test of the Career Area Rotation Model," was received from Headquarters, US Air Force (USAF/DPX). This mandate for research was used to accomplish two objectives. The first objective

was to conduct the final testing of the Control Data Corporation (CDC) Extended FORTRAN version of the model. The CDC computer at the Armament Development and Test Center at Eglin AFB was used to test CAROM and at the same time to accomplish the second objective, which was to actually exercise the model and experience the data input and output interpretation that would be required to utilize the model. The operating characteristics of CAROM were thoroughly tested. Individual model records were traced through the system, and their data record was printed and reviewed periodically. Additionally, various types of possible real-world applications were studied with a small test file to determine the applicability of CAROM to the analysis and solution of such problems as force reduction, tour length changes, promotion system variation, and separation and loss re-parameterization. As AFHRL desired both to test the model and to meet user RPR requirements, grade/skill level assignment option test runs were performed with this test file and with the operational files under RPR 73–14.

The final version of the model (Williams, Looper, & Morton, 1973) from DSAI was received late in 1973 and reprogramming efforts began immediately to produce an AFHRL Univac 1108 version of CAROM. One additional modification was made to AFHRL's CDC version shortly before the end of the contract. This modification was the incorporation of the equal selection promotion system into the model. This modification permitted the completion of the research specified in RPR 73–14.

At the request of the Air Force Institute of Technology (AFIT), CAROM was sent to Wright-Patterson AFB for use as an educational research tool. Two Master theses have resulted from the use of the model. The first of these, Needham (1974), was involved with the use of CAROM to study problems within specific career fields, and the second, Faucheux (1975), studied the relationships of personnel policies to manpower requirements. Each of these theses employed CAROM as the analysis tool in their research.

Shortly after the receipt of the final version of CAROM, an additional RPR (RPR 74–17, "Test of Possible Civilianization of Consolidated Base Personnel Office (CBPO) Resources") was received from the Assistant for Personnel Plans, Programs and Analyses (DPMY) at AFMPC to study further some of the problems of civilianizing military positions. So that CAROM could more effectively meet some of the requirements of this RPR, several additional modifications were planned. As a result, some of the more permanent input data were placed as part of the computer control data to the Univac 1108, and a new loss factor card was incorporated into the model, as well as the promotion system being time-phased to make it more nearly duplicate the cyclical pattern of Air Force promotions. These modifications were accomplished by AFHRL personnel and have been documented in Hughes (1975). Following the receipt of RPR 74–17 and completion of the modifications, the research was satisfied by model output. Since the completion of this RPR, the model has been used in-house to explore its additional utility as a personnel research tool and to study its relationship to other AFHRL modelling efforts.

III. RELATIONSHIP OF CAROM TO AFHRL MODELLING EFFORTS

The relationship of CAROM to other modelling efforts must be seen in light of historical AFHRL model development. Votaw (1959) discussed an operational, computerized approach to Air Force assignments. In the 1960–1970 time frame, AFHRL took early steps toward model development in the manpower area. Holdrege (1962) published a conceptual model of the recruit processing system. Harding and Merck (1964) and Merck (1965) utilized Markov theory to build models of retirement prediction and the personnel system based on the Kossack and Beckwith (1959) research. After 1965, AFHRL undertook the task of assisting in the development of an operational recruit training assignment procedure and did perform this operational procedure for some time in the late 1960's. Related to these research efforts was the Ward (1959) research in

the use of a "decision index," which attempted to incorporate personnel characteristics into a mathematical statement of person-job fit. This particular research has become a vital portion of the Automated Person-Job Match Recruiting System in use today by the Air Force Training Command (see Ward, 1977; Ward & Haltman, 1974). Each of these previous efforts concentrated on a single or limited facet of the personnel and manpower system or approached the total system with a single mathematical tool (e.g., Markov analysis). However, with the initial design and subsequent development of CAROM, AFHRL has been involved with the construction of large scale, computerized models of significant segments of the Air Force manpower and personnel system. Five of these models will be discussed, since they represent complementary approaches to CAROM.

The Total Objective Plan for the Officer Procurement System (TOPOPS) as documented in Akman, and Nordhauser (1974), Akman, Nordhauser, and Roach (1974), and Knight, Stefancyk, and Looper (1977) is a large scale linear programming model which simulates the accession and training of officers to achieve optimal solutions to cost and quality objectives. This particular model is purely deterministic and has no stochastic properties other than those extrenally computed by the user.

The Training Line Simulator (TLS), as documented in Hatch, Pierce, Nauta, and Pina (1974), Hatch, Pierce, Nauta, and Zimmer (1972), and Nauta and Pierce (1973), is a simulation model incorporating both stochastic and deterministic features which is designed to simulate the progression of airmen through basic training, initial technical training assignment, and the technical training program. In a sense, this model is the complementary one to TOPOPS, representing the enlisted force, and could also serve as input to CAROM; that is, as initially trained individuals in a particular career field which can be career progressed through the CAROM model.

The Short Tour Rotation Indices (STRI) is another deterministic model (see Taylor, 1976), which attempts to bring to light those career fields (AFSCs) which may suffer or be suffering CONUS rotation base shortage problems in the filling of overseas slots. This type of model is related to CAROM in that after such problem Air Force Specialty Codes (AFSCs) are identified, CAROM can simulate their career progression portions, further highlighting the problems or evaluating possible solutions.

A fourth model, the Personnel Availability Model (PAM) documented in Goclowski, LoFaso, Peskoe, Baran, & Dieterly (1979) provides information about the future availability of qualified military personnel. Such information is vital not only for guiding weapon system design to incorporate personnel resource constraints, but also to provide information to Air Force manpower and personnel planners and decision makers to enable them to acquire and sustain a force to maintain and operate such weapon systems.

Finally, the Integrated Simulation Evaluation Model (ISEM) is an attempt to construct a large scale, detailed simulation picture of the whole of the Air Force manpower and personnel system (see De Vany, Reynolds, & Shugart, 1977; Knight, Pope, & Polk, 1977). Such an integrative, unified model should incorporate pertinent subsets from each of the previously developed AFHRL models, yet this model will capture the myriad of interactions among the system's submembers. CAROM provides a basis for an optimization of enlisted assignments and could serve as an input-producing and output-analyzing tool for ISEM.

IV. MANAGEMENT OVERVIEW OF CAROM

To describe CAROM, there will first be a presentation of some of the general characteristics of CAROM as an operations research model. Then, there will be a description of its major design features, including its assignment algorithm. CAROM is an entity-type simulation model because it matures or simulates the career progression of individual airmen on a monthly basis. This is

different from other Air Force force projection models which do not simulate the status of individual entities. CAROM does, however, have aggregate-type outputs. CAROM is computer based due to its size and the large number of personnel that must be simulated in a typical AFSC. The only constraining factor on the maximum number of personnel simulated at one time is the size of the computer.

CAROM is basically an operations research model. Linear programming techniques are used to assign enlisted personnel by grade and skill to four major types of tours. Monte Carlo simulation is utilized not only in the selection of each airman to change his status in a certain manner, but also in the selection of the parameter value of his status change. In CAROM, Monte Carlo simulation is accomplished using random sampling subject to the user-specified input policy parameters.

An important characteristic of CAROM is that it is a planning or policy gaming model. The principal advantage of a Monte Carlo simulation model is that it can often capture highly complex interactions which no other technique can capture. Simulation models, however, do not produce the high level of precision required for some operational applications. In the planning function of evaluating different policy alternatives, CAROM can provide insight and evidence to the user on the overall effect of each alternative on the occupational specialty.

CAROM is primarily designed to simulate the accession, grade and skill promotion, reassignment, and attrition of enlisted personnel within a single AFSC on a monthly basis for up to 30 years.

There are two types of input to CAROM, personnel records and policy parameters. Each entity has an associated personnel record which consist of 20 parameters (see Appendix A). The status of each entity, as represented by the individual parameters, is changed according to input policy parameters (see Appendix B). An initial set of personnel records and values of policy parameters must be specified by the user at time period zero (t_o) to initiate the run. For each month following t_o, a set of personnel records is input and is the accession into the AFSC for that month. Input policy may be changed at any time during the run.

CAROM output is displayed in three reports: Monthly Summary Report; Manning Level Report; and Assignment, Loss, and Promotion Report (see Appendix C). Personnel records may be reported at the end of each time period if desired by the user and analyzed later.

The first step in CAROM's grade promotion is a check for eligibility of each airman according to his time in grade, time in service, and skill against the specified minimums for each of these factors. Promotion quotas in the model can be calculated using either the AFSC vacancy method or the equal selection opportunity method. Individuals are promoted in order of their total promotion scores as calculated by a user-specified equation for each grade. In addition to time in grade and time in service, up to six different variables may be specified in each equation. Each variable has an associated specified weight so that current WAPS methodology may be simulated.

Skill upgrading is accomplished using three types of policy parameters: minimum time in skill for upgrading to the next skill, fixed times past each minimum, and grade.

CAROM attrition, as simulated by Monte Carlo procedures, is classified into eight different types: exceptional attrition, such as death or court martial, according to an exceptional attrition rate; up or out losses according to a maximum allowable time in service for each grade; mandatory retirement at 30 years time in service; voluntary retirement from 20 to 29 years of service; normal expiration term of service or non-reenlistment according to a retention rate for each year of service; general and tour completion early-outs according to specified times before projected separation dates, cross-training losses according to a specified allowable CONUS overage, and additional non-specified losses.

The first step in CAROM's assignment procedure is the determination of reassignment eligibility for each airman. There is a maximum of four major tour types to which an airman can be assigned, CONUS and three non-CONUS tours. Within each tour type, there is a maximum of 10 different tour lengths. In addition, CONUS contains a normal tour length which has a minimum time to be served in, after which an airman may not necessarily be reassigned. To be eligible for reassignment, an airman must have reached his tour completion date and met other minimum requirements.

Once the reassignment eligibles for a certain month have been identified, CAROM solves two linear programming transportation problems to optimally assign these eligibles. First, the fill of grade/skill vacancies in each tour is maximized. These maximum fill totals are utilized to constrain the actual assignment of the eligibles such that their grade/skill/tour sequence information is maximally fit to the grade/skill/tour positions.

One of the most computer-efficient algorithms for optimally assigning M groups of identically classified airmen to K job categories is the Ford-Fulkerson primal-dual network flow algorithm utilized by CAROM. Airmen eligible for reassignment in CAROM are classified into groups according to grade/skill combinations, tour eligibilities, and tour sequences. These groups define the rows of CAROM's eligibility matrix. The columns are defined by the different grade/skill/tour positions which represent the job categories. This matrix is used in the Ford-Fulkerson solution of both the maximization of fill and maximization of fit problems.

Whenever there is a shortage of airmen to fill job categories, these shortages are either shared or a priority system is utilized according to user policy. In a shortage sharing policy, sharing coefficients are specified for a non-linear allocation of the shortages. Shortage-sharing relationships are non-linear because the larger the shortage of job category A compared with job category B, the greater the cost of each vacancy in job category A relative to B. Under a priority system, if job category A has a higher priority than job category B, then it will be filled at the expense of B.

After the personnel records have been updated, assignment eligibilities computed, and assignments made, CAROM looks ahead 1 month for future personnel parameter updating and then produces the user-specified output reports. The three standard reports may be time and grade/skill tailored to user interest and the personnel records themselves may be analyzed in detail to produce unique reports.

In summary then, CAROM is a general purpose personnel planning model which is primarily designed to simulate the career progression of enlisted personnel within a single occupational specialty. It is an operations research model which contains linear programming and Monte Carlo simulation techniques. Due to its broad nature, CAROM should be considered for utilization in many different personnel policy evaluation functions. Its capability of capturing the complex interactions underlying the personnel activities of accession, grade promotion, skill upgrading, reassignment, and attrition is the basis of CAROM's potential usefulness and advantage over many other deterministic manpower planning models.

V. UTILIZATION OF CAROM

The historical usages of CAROM have been previously mentioned as part of the model's developmental history. It has not been shown, however, specifically how CAROM has been used and how it could be used as a policy gaming decision simulation model. It should again be stated that the model is not intended for operational assignment, promotion, and loss projections; that is, it should not be used to actually assign or promote any individual nor to project the career progression of actual Air Force members. The purpose of models such as CAROM is to investigate

and analyze the possible effects of changes in force structure or changes in personnel policy parameters. The model is to be utilized as an aid in the policy decision process but should not replace the actual decision process; in fact, no model should serve as a replacement for the managerial decision process but should be used as an adjunct device or, as in the case of CAROM, a policy simulation or gaming tool.

It is just for such a function that CAROM has been utilized in the past. This section of the report will focus on the two primary usages of CAROM to satisfy direct user needs. The first of these uses was to analyze the impact on position fill of promoting individuals based on vacancies in each career field or based on an overall total force vacancy system.

The specific objective was to compare the effect of the Equal Selection Opportunity (ESO) promotion quota system on the airman force with that of the previously operational Promotion Management List (PML) quota system. These two airmen quota systems deal with the promotion of airmen to grades E-5 and above. A comparison of them was important to determine advantages or disadvantages of either system in meeting Air Force personnel needs.

Computation of the promotion quota for each grade under ESO, which became operational in December 1971, is based on a fixed percentage of airmen eligible to be promoted. Each percentage is applied to all airman AFSCs. Under PML, however, each grade quota in each AFSC is computed according to both the number of airmen eligible to be promoted and the number of authorized grade vacancies in the AFSC. Therefore, the primary difference between ESO and PML is that PML is logically more sensitive to the number of authorized grade vacancies in each AFSC. It was believed that there was a greater chance for grade shortages or overages under ESO due to its relative lack of grade vacancy sensitivity in certain AFSCs.

To verify this hypothesis, 10 computer runs of five selected AFSCs were accomplished, utilizing CAROM. Two runs were accomplished, one using ESO and one using PML, for each of the following career areas: 303X2 [Aircraft Control and Warning (AC&W) Radar Repairman], 571X0 (Fire Protection Specialist), 622X0 (Cook/Food Service Specialist), 732XX (Personnel Specialist), and 811XX (Security Police). Each run was 120 monthly time periods. End-year grade strength data were extracted from the CAROM output reports to be analyzed in the comparison of the ESO and PML promotion quota systems. An overview of the 10 CAROM simulation runs shows the following points:

1. There was a total of 10 simulation runs, each of 120 monthly time periods.

2. Two runs, one using ESO and one using PML, were accomplished for each of five AFSCs: 303X2 (AC&W Radar Repairman), 571X0 (Fire Protection Specialist), 622X0 (Cook/Food Service Specialist), 732XX (Personnel Specialist), and 811XX (Security Police).

3. Policy parameters as of March 1973 were utilized.

4. The initial (t = 0) personnel record data base for each AFSC was extracted from the December 1971 Uniform Airman Records (UAR).

5. For each monthly time period subsequent to t = 0, a constant number of E-2 CONUS accessions was input into each AFSC: 60 (303X2), 235 (571X0), 135 (622X0), 190 (732XX), and 685 (811XX).

6. Total authorized strength for each AFSC was as follows: 3,499 (303X2), 7,991 (571X0), 6,176 (622X0), 11,834 (732XX), and 20,131 (811XX).

7. The maximum allowable CONUS overage for each AFSC was as follows: 175 (303X2), 400 (571X0), 926 (622X0), 1,183 (732XX), and 1,007 (811XX).

8. Authorized grade positions for AFSCs 303X2, 622X0, and 811XX were E-3 through E-7, and for AFSC 571X0 and 732XX were E-3 through E-9. Airmen promoted to E-8 and E-9 in AFSCs 303X2, 622X0, and 811XX were attrited from CONUS overage as cross-trainees as soon as possible.

9. Authorized grade totals for E-3 included authorized E-2 strength.

10. FY73 ESO percentages of eligibles to be promoted to each grade were utilized in each ESO run: 11.1% (E-9), 7.4% (E-8), 10.2% (E-7), 10.6% (E-6), 20.9% (E-5), 44.3% (E-4), and 100% (E-3).

11. Four tours were defined as follows: CONUS, Southeast Asia (SEA, 12 months), Short (12 months), and Long (18 months or more).

12. According to the percentage of the total authorized grade positions of each AFSC which were of grade E-6 and above, each AFSC was classified into one of two groups: High Supervisory (303X2, 31%, and 732XX, 45%) and Low Supervisory (571X0, 10%; 622X0, 13%; and 811XX, 7.5%).

The Air Force accession requirement for each AFSC was basically computed as follows. Loss rates were applied to current AFSC strength levels to compute projected strength levels. These projections were subtracted from projected authorized strength levels to compute each AFSC accession requirement. This was the operational procedure of accessing the number of airmen into an AFSC equal to the number of authorized vacancies in the AFSC.

In the design of CAROM, monthly accession is determined by the user prior to the simulation run. A constant monthly accession input as described in Item 5 above will tend to cause significant overage manning levels in lower grades. In effect, a constant monthly input to an AFSC is insensitive to authorized vacancies in the AFSC.

The five constant input totals in Item 5, one for each AFSC, were determined utilizing averages of historical monthly input totals to each technical school for each AFSC. These constants were inflated relative to actual AFSC requirements because significant numbers of airmen often "washed out" of technical schools.

An assumption in this study was that the inflated and constant monthly accession input of E-2 airmen to each AFSC would not preclude a useful analysis of higher grades, E-5 and above.

The major conclusions drawn from this use of CAROM were that grade strength levels were generally more stable under the ESO system. More shortage was observed in the ESO system for grades E-5 and E-6 (AFSCs 571X0, 732XX, and 811XX). Both systems had overages, PML for two AFSCs (303X2 and 622X0) and ESO for two AFSCs (303X2 and 732XX).

Less reliance could be placed on overage distortions due to the constant and inflated accession input to each AFSC. The relative CONUS shortages of the ESO system in three AFSCs, however, supported the hypothesis that there was more chance for distortion of grade strength levels than in the PML system.

The second research task from RPR 73–14 completed by CAROM was the simulation of AFSC 571X0 (Fire Protection Specialist) with varying degrees of civilian/military mix. It was decided that such career progression would be simulated for AFSC 571X0 under five different percentage reductions of CONUS authorized strength in skills 5, 7, and 9: 0%, 25%, 50%, 75%, and 100%. Five different CAROM simulation runs of AFSC 571X0, one for each percentage reduction, were accomplished; each simulation run was 120 monthly time periods in length.

One important area of interest associated with an Air Force civilianization program is the effects of reducing the CONUS authorized strength of certain AFSC skill levels on the length of expected time between different tours. For example, of obvious importance is the expected time between short tours. A reduction in authorized CONUS strength could cause a significant depletion of manpower supply for overseas rotation to maintain a sufficient manning level in short tours. This result could cause the average time between short tours to become smaller than the minimum acceptable time.

To compute the average times between tours, personnel records were output for time periods 96 and 120 in the model simulation. Utilizing "time since last tour" information, the times —

between tours for 12 combinations of tours for each individual were computed: Short-Short, SEA-SEA, Long-Long, CONUS-Short, CONUS-SEA, CONUS-Long, Short-SEA, Short-Long, Long-SEA, Long-Short, SEA-Short, and SEA-Long. The averages of the times between tours for each combination were computed utilizing all airmen in months 96 and 120 who had such times computed. Table 1 includes these 12 averages for each reduction percentage. The sample sizes of airmen utilized to compute each average are given in Table 2. For each sample size judged to be too small, an asterisk is given in Table 1 which means that no average was computed, and the associated sample size is given in Table 2. Utilizing regression analyses with average time between tours as the criterion variable and percent reduction of authorized strength as the predictor variable, a set of regression equation coefficients for each tour combination was computed. Table 3 contains these regression constants and predictor variable coefficients for each regression equation. The regression coefficients of Table 3 can be utilized to obtain exact values for the expected times between various tour types.[1] The simple correlation coefficient for each equation is also given in this table. An overview of the five CAROM simulations of AFSC 571X0 (Fire Protection Specialist) shows the following model features:

Table 1. **Average Times Between Tours in Months**

Variable	Percent Reduction of CONUS Skills 5, 7, and 9				
	0	25	50	75	100
Average Time Between Short Tours	75	39	31	40	*
Average Time Between SEA Tours	61	84	42	*	*
Average Time Between Long Tours	69	50	42	63	69
Average Time Between CONUS and Short Tours	18	13	12	3	*
Average Time Between CONUS and SEA Tours	25	19	18	5	*
Average Time Between CONUS and Long Tours	16	15	12	9	*
Average Time Between Short and SEA Tours	104	79	54	*	*
Average Time Between Short and Long Tours	31	24	16	7	7
Average Time Between Long and SEA Tours	52	43	37	27	24
Average Time Between Long and Short Tours	56	39	34	27	26
Average Time Between SEA and Short Tours	79	25	32	18	*
Average Time Between SEA and Long Tours	30	27	14	6	5

*Not significant due to small sample size.

[1]The predictor variable coefficient must be multiplied by the desired percentage reduction, and this product is added to the regression constant. Predictor variable values are percentage reductions. For example, a 26.4% reduction would be a predictor variable value of 26.4 (not .264).

Table 2. **Sample Sizes for Table 1**

Variable	0	25	50	75	100
	Percent Reduction of CONUS Skills 5, 7, and 9				
Average Time Between Short Tours	25	137	173	16	1
Average Time Between SEA Tours	10	25	37	3	0
Average Time Between Long Tours	140	314	533	50	11
Average Time Between CONUS and Short Tours	2,145	992	650	270	0
Average Time Between CONUS and SEA Tours	772	476	327	66	0
Average Time Between CONUS and Long Tours	1,823	1,200	810	135	0
Average Time Between Short and SEA Tours	20	46	88	1	1
Average Time Between Short and Long Tours	143	378	375	509	626
Average Time Between Long and SEA Tours	273	445	419	202	121
Average Time Between Long and Short Tours	171	568	557	295	336
Average Time Between SEA and Short Tours	20	93	50	11	0
Average Time Between SEA and Long Tours	78	122	173	276	386

Table 3. **Linear Regression Coefficients**

Criterion Variable	Const	Coefficient of Predictor Variable	Simple Correlation Coefficients
Average Time Between Short Tours	61.10	–.416	–.741
Average Time Between SEA Tours	71.83	–.380	–.451
Average Time Between Long Tours	56.00	.052	.170
Average Time Between CONUS and Short Tours	18.40	–0.184	–.951
Average Time Between CONUS and SEA Tours	25.90	–0.244	–.935
Average Time Between CONUS and Long Tours	16.60	–0.096	–.980
Average Time Between Short and SEA Tours	104.00	–1.000	–.999
Average Time Between Short and Long Tours	30.00	–0.260	–.973
Average Time Between Long and SEA Tours	51.0	–0.288	–.990
Average Time Between Long and Short Tours	50.8	–.288	–.935
Average Time Between SEA and Short Tours	64.90	–0.704	–.823
Average Time Between SEA and Long Tours	30.60	–0.284	–.965

1. There was a total of five simulation runs. Each run was 120 monthly time periods.

2. Each run utilized the ESO promotion quota system with FY 73 percentages as follows: to grade E-9, 11.1%; to grade E-8, 7.4%; to grade E-7, 10.2%; to grade E-6, 10.6%; to grade E-5, 20.9%; to grade E-4, 44.3%; to grade E-3, 100%.

3. Policy parameters as of March 1973 were utilized.

4. The initial (time period = 0) personnel record data base was extracted from December 1971 UAR.

5. For each monthly time period subsequent to t = 0, a constant number of 235 E-2 CONUS accessions was input to the model.

6. Total initial authorized strength for AFSC 571X0 is given in Item 10. Each of the remaining four runs represented an increased reduction of CONUS authorized strengths for skill levels 5, 7, and 9 in increments of 25%. This reduction simulated the conversion of military positions to civilian postiions in a Civilianization Program for AFSC 571X0.

7. The maximum allowable CONUS average was 5% of total authorized strength.

8. All grades from E-3 to E-9 were authorized. E-3 grade totals included E-2 strength authorizations.

9. Four tours were defined as follows: CONUS, Southeast Asia (SEA, 12 months), Short (12 months), and Long (18 months or more).

10. Authorized Strength Levels, AFSC 571X0 (at 0% reduction for skills 5, 7, and 9):

CONUS, Grade/Skill		SEA, Grade/Skill		Short, Grade/Skill		Long, Grade/Skill	
E3/3	2,034	E3/3	44	E3/3	197	E3/3	495
E4/5	1,474	E4/5	114	E4/5	228	E4/5	518
E5/5	1,396	E5/5	83	E5/5	200	E5/5	378
E6/7	275	E6/7	21	E6/7	46	E6/7	121
E7/7	152	E7/7	7	E7/7	15	E7/7	60
E8/9	64	E8/9	6	E8/9	5	E8/9	30
E9/9	16			E9/9	2	E9/9	10
Total	5,411	Total	275	Total	693	Total	1,612

It is important to note that on all of the tour analyses, except Average Time Between Long Tours, the regression equation line had a negative slope. For these 11 tour combinations, the expected time between tours decreased with an increasing percentage reduction of authorized CONUS strength for skill levels 5, 7, and 9. This decreasing CONUS strength caused the airmen remaining in the AFSC to be reassigned more frequently to meet the fixed overseas demands which, in turn, reduced the average times between the tours.

For the average times between long tours, however, there was a positive regression slope which was caused primarily by the 75% and 100% reduction points. There is a logical explanation for this phenomenon which is a clear demonstration of the value of an effective simulation model. Of the three overseas tours, SEA tours had the highest priority[2]; short tours, the second highest; and long tours, the lowest priority. At the 75% and 100% authorized strength reduction levels, the supply of airmen for rotation to the overseas tours was so depleted that it became impossible to satisfy the demands of long tours. The SEA and short tours both had absolute priority over long tours to an extent that under depletions of CONUS manpower, the average time between long tours increased; that is, airmen were being assigned to SEA and short tours at the expense of the long tours.

This particular application of CAROM is specific and practical in nature. The model did provide valuable information to the Air Force manpower and personnel analysis and planners concerned with the civilianization of a particular AFSC. The analyses presented in this section,

[2]In CAROM, absolute priorities can be assigned to one tour over another or the authorized shortages can be shared in some manner. A tour with a higher absolute priority than another tour has its vacancies filled at the expense of the other tour (utilizing legal grade/skill substitutions, of course).

including the previously discussed promotion quota analysis, fully support the position that CAROM does provide accurate and valuable information that few other personnel management tools currently in the Air Force inventory can provide.

VI. CONCLUSIONS

As with the other models in the AFHRL inventory of manpower and personnel simulation and decision models, CAROM remains ready to assist in the personnel and manpower decision process. Historically, CAROM has performed analysis tasks for Air Staff and serves as a research tool for AFIT education training. CAROM is an important link in the long chain of model development begun some 18 years ago by AFHRL. The direction is toward a goal of readily usable and interpretable models of manpower and personnel structures and processes. Such models will assist, not replace, decision makers and managers and will help them make informed and effective decisions and formulate viable manpower and personnel policies.

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APPENDIX A: PERSONNEL RECORD PARAMETERS

1. Date of Enlistment
2. Estimated Date of Separation
3. Date of Rank
4. Current Assignment Category
5. Projected Tour Completion Date
6. Number of Previous Remote Tours
7. Date of Completion of Most Recent Remote Tour
8. Number of Previous Special Tours
9. Date of Completion of Most Recent Special Tour
10. Number of Previous Long Tours
11. Date of Completion of Most Recent Long Tour
12. Number of Previous CONUS Tours
13. Date of Completion of Most Recent CONUS Tour
14. Skill Level
15. Grade
16. Number of Months at Current Skill Level
17. Specialty Knowledge Test (SKT)
18. Promotion Fitness Examination (PEE)
19. Airmen Proficiency Rating (APR)
20. Decorations Score (DEC)
21. Unspecified Factor 1
22. Unspecified Factor 2

APPENDIX B: POLICY CONTROL CARDS

Number	Name
01	Run Parameter
02	Legal Grade/Skill Combinations
03	Tour Sequence Desirability
04	Grade/Skill Substitution
05	Grade/Skill/Tour Sequence Level Definition
06	Sharing Policy and Priority
07	WAPS Updating Data
08	Model Parameter and Eligibility
09	Minimum Time in Grade
10	Minimum Time in Skill
11	Minimum Time in Service
12	Weights for Test Scores
13	Skill Level Promotion Distribution
14	First Termer Reenlistment Distribution

Number	Names
15	Career Reenlistment Distribution
16	Minimum Obligation Upon Promotion
17	Retention Rate
18	Up or Out
19	Authorized Strength
20	Tour Length Distribution
21	Assignment Eligibility
22	General Early Out
23	Tour Completion Early Out
24	Decoration Score Updating
25	Grade and Above
26	Equal Selection Promotion Quota
27,	Loss Rate

APPENDIX C: CAROM OUTPUT REPORTS

```
        C A R O M                                          INPUT FOR TIME PERIOD    0                                                   PAGE    1

RUN PARAMETER CARD                          000 01 B CAROM RUN ON 73XXX(TEST)                  7807      120  1 40 AAAA
GRADE/SKILL COMBINATIONS CARD               000 02         3579    9 9    9 9    3 9    3 7    3 7    3 5    3 5    3 5
TOUR SEQUENCE DESIRABILITY CARD             000 03 S
                                            000 03 R         F  C                      E  B        D  A
                                            000 03 A  A         D              C          F  R        E
                                            000 03 C  A      D                     B   E     C     F
GRADE/SKILL LEVEL SUBSTITUTION CARD         000 04 99 89
                                            000 04 89 79 99
                                            000 04 79 89
                                            000 04 77 67 57
                                            000 04 67 57 77
                                            000 04 57 67
                                            000 04 55 45
                                            000 04 45 35
                                            000 04 35 25
                                            000 04 33 23
                                            000 04 25 35
                                            000 04 23 33
LEVEL DEFINITION CARD                       000 05 99BF
                                            000 05 89BF
                                            000 05 79BF
                                            000 05 77CF
                                            000 05 67CF
                                            000 05 57BF
                                            000 05 55BF
                                            000 05 45BF
                                            000 05 35BF
                                            000 05 33BF
                                            000 05 25BF
                                            000 05 23BF
SHARING POLICY AND PRIORITY CARD            000 06 99    1.0    1.0    1.0    1.0      1      4      2      3
                                            000 06 89    1.0    1.0    1.0    1.0      1      4      2      3
                                            000 06 79    1.0    1.0    1.0    1.0      1      4      2      3
                                            000 06 77    1.0    1.0    1.0    1.0      1      4      2      3
                                            000 06 67    1.0    1.0    1.0    1.0      1      4      2      3
                                            000 06 57    1.0    1.0    1.0    1.0      1      4      2      3
                                            000 06 55    1.0    1.0    1.0    1.0      1      4      2      3
                                            000 06 45    1.0    1.0    1.0    1.0      1      4      2      3
                                            000 06 35    1.0    1.0    1.0    1.0      1      4      2      3
                                            000 06 33    1.0    1.0    1.0    1.0      1      4      2      3
                                            000 06 25    1.0    1.0    1.0    1.0      1      4      2      3
                                            000 06 23    1.0    1.0    1.0    1.0      1      4      2      3
WAPS UPDATING DATA CARD                     000 07          12   12.2    9.7    5.0    0.0    0.0     25
MODEL PARAMETER AND ELIGIBILITY CARD        000 08       12217  .0002             0     12    240     12     48    0.2    .30
MINIMUM TIME IN GRADE CARD                  000 09          13     13     19     13      7      3      8                          ..
MINIMUM TIME IN SKILL LEVEL CARD            000 10           1     12      1      6      1      6      1                          ..
MINIMUM TIME IN SERVICE CARD                000 11         268    236    204    157     54     25     12
WEIGHTS OF TEST SCORES CARD                 000 12 2         0      0      0      0      0      0      0    1.0                   ..
                                            000 12 3         0      0      0      0      0      0    1.0      0                   ..
                                            000 12 4       1.0    1.0    1.5    1.0      0      0    0.5  0.167                   ..
                                            000 12 5       1.0    1.0    1.5    1.0      0      0    0.5  0.167                   ..
                                            000 12 6       1.0    1.0    1.5    1.0      0      0    0.5  0.167                   ..
```

	000 12 7	1.5	1.0	1.0	0.5	0	0	2.0	2.0			••
	000 12 8	1.5	1.0	1.0	0.5	0	0	2.0	2.0			••
SKILL PROMOTION DISTRIBUTION CARD	000 13 3	0	1.0									
	000 13 5	0	1.0									
	000 13 7	0	1.0									
	000 13 9	0	.25	36	.75							
FIRST TERMER REENLISTMENT DIST. CARD	000 14	48	1.0									••
CAREERIST REENLISTMENT DIST. CARD	000 15	48	1.0									••
MIN OBLIGATION UPON PROMOTION CARD	000 16	24	24	24	0	0	0	0				••
REENLISTMENT RATE CARD	000 17 0	.95	.95	.95	.377	.70	.377	.90	.724	.90	.724	
	000 17 1	.90	.784	.90	.784	.90	.894	.90	.894	.90	.518	
	000 17 2	.774	.779	.754	.799	.747	.680	.746	.529	.700	.908	
UP OR OUT CARD	000 18	336	312	276	240	96	48	48				••
AUTHORIZED STRENGTH CARD	000 19 C9	.348	.652							.300		
	000 19 C7			.421	.579					.250		
	000 19 C5					.458	.542			.133		
	000 19 C3							1.0	0.0	.100		
	000 19 R3							1.0	0.0	.004		
	000 19 R5					.457	.543			.010		
	000 19 R7			.423	.577					.021		
	000 19 R9	.351	.649							.014		
	000 19 A9	.350	.650							.025		
	000 19 A7			.421	.579					.065		
	000 19 A5					.457	.543			.028		
	000 19 A3							1.0	0.0	.025		
	000 19 S3											
	000 19 S5											
	000 19 S7											
	000 19 S9											
TOUR LENGTH DISTRIBUTION CARD	000 20 CF	24	1.0									
	000 20 CC	24	1.0									
	000 20 SF	24	1.0									
	000 20 SC	24	1.0									
	000 20 AC	18	.05	24	.20	30	.05	36	.70			
	000 20 AF	18	.15	24	.60	30	.10	36	.15			
	000 20 RF	12	1.0									
	000 20 RC	12	1.0									
ASSIGNMENT ELIGIBILITY CARD	000 21 A	12	0	0	12	15	15	5	5	0.01		
	000 21 R	12	0	0	9	2	2	5	5	0.01		
	000 21 S	0	0	0	0	0	0	0	0	0.0		
GENERAL EARLY OUT POLICY CARD	000 22	0	0.0	0.0	0.0	0.0						
TOUR COMPLETION EARLY OUT POLICY CARD	000 23 F	5	1.0	5	1.0	5	1.0					
	000 23 C	5	0.0	5	0.0	5	0.0					
DECORATION DISTRIBUTION CARD	000 24 R	00	0.985	03	0.015							
	000 24 A	00	0.973	03	0.027							
	000 24 S											
	000 24 C	00	0.977	03	0.023							
GRADE-AND-ABOVE CARD	000 25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0			
LOSS RATE CARD	000 27 0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	000 27 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

```
PROMOTION OPPORTUNITY CARD        001 26 3    1.0 1  1.0
                                  001 26 4 0.0416 6 0.14 0.14 0.17 0.17 0.19 0.19
                                  001 26 5 0.0671 60.1670.1670.1670.1660.1660.167
                                  001 26 6 0.0635 6 0.13 0.13 0.16 0.16 0.20 0.22
                                  001 26 7 0.0705 6 0.16 0.17 0.16 0.17 0.17 0.17
                                  001 26 8   0.1412 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.10 0.10
                                  001 26 9 0.187012 0.08 0.08 0.09 0.08 0.08 0.09 0.08 0.08 0.09 0.08 0.08 0.09
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C A R O M   CAROM RUN ON 73XXX(TEST)   DATE 78/07/   PAGE 29

MANNING LEVEL REPORT   SIMULATION TIME PERIOD 41

TOUR CATEGORY	GRADE E9	GRADE E8	GRADE E7	GRADE E6	GRADE E5	GRADE E4	GRADE E3	GRADE E1/E2	TOTAL BY TOUR
REMOTE TOUR									
ACTUAL	4	66	107	225	51	111	0	0	564
AUTHORIZED	62	114	111	152	57	68	50	0	614
OVERAGE (- IF SHORTAGE)	-58	-48	-4	73	-6	43	-50	0	-50
PER CENT FILLED FROM GRADES BELOW	93.5	93.0	100.0	9.2	75.4	.0	.0	.0	
PER CENT FILLED FROM GRADES ABOVE	.0	.0	.0	.7	.0	.0	.0	.0	
PER CENT TOTAL SPACES FILLED	100.0	100.0	100.0	100.0	100.0	100.0	.0	.0	
SPECIAL TOUR									
ACTUAL	0	0	0	0	0	0	0	0	0
AUTHORIZED	0	0	0	0	0	0	0	0	0
OVERAGE (- IF SHORTAGE)	0	0	0	0	0	0	0	0	0
PER CENT FILLED FROM GRADES BELOW	.0	.0	.0	.0	.0	.0	.0	.0	
PER CENT FILLED FROM GRADES ABOVE	.0	.0	.0	.0	.0	.0	.0	.0	
PER CENT TOTAL SPACES FILLED	.0	.0	.0	.0	.0	.0	.0	.0	
ACCOMPANIED TOUR									
ACTUAL	45	105	166	360	452	341	9	0	1478
AUTHORIZED	109	204	343	471	161	190	313	0	1791
OVERAGE (- IF SHORTAGE)	-64	-99	-177	-111	291	151	-304	0	-313
PER CENT FILLED FROM GRADES BELOW	58.7	79.9	99.1	94.1	99.4	4.7	.0	.0	
PER CENT FILLED FROM GRADES ABOVE	.0	.0	.0	.0	.0	.0	.0	.0	
PER CENT TOTAL SPACES FILLED	100.0	100.0	100.0	100.0	100.0	100.0	.0	.0	
CONUS TOUR									
ACTUAL	263	256	615	814	2466	1376	3419	625	9834
AUTHORIZED	1308	2451	1319	1814	763	904	1253	0	9812
OVERAGE (- IF SHORTAGE)	-1045	-2195	-704	-1000	1703	472	2166	625	22
PER CENT FILLED FROM GRADES BELOW	19.6	24.9	88.6	60.3	81.9	100.0	37.4	.0	
PER CENT FILLED FROM GRADES ABOVE	.0	5.1	.0	.1	.0	.0	.0	.0	
PER CENT TOTAL SPACES FILLED	30.0	30.1	88.9	88.9	88.9	100.0	37.4	.0	
TOTAL BY GRADE									
ACTUAL	312	427	888	1399	2969	1828	3428	625	11876
AUTHORIZED	1479	2769	1773	2437	981	1162	1616	0	12217
OVERAGE (- IF SHORTAGE)	-1167	-2342	-885	-1038	1988	666	1812	625	-341

ASSIGNMENT, LOSS AND PROMOTION REPORT

SUMMARY FOR TIME PERIODS 2 TO 41

NUMBER OF NEW ACCESSIONS 4360

TOUR CATEGORY	GRADE E9	GRADE E8	GRADE E7	GRADE E6	GRADE E5	GRADE E4	GRADE E3	GRADE E1/E2	TOTAL BY TOUR
REMOTE TOUR									
•ASSIGNMENTS• MOVES TO	16	207	354	600	178	314	19	0	1688
TRANSFER FROM	46	141	268	377	275	261	32	0	1400
•LOSSES• TOTAL	5	41	68	70	39	70	14	0	307
NON-REENLISTMENT	5	39	63	54	26	53	10	0	250
EXCEPTIONAL ATTRITION	0	0	1	0	1	0	0	0	2
EARLY OUT	0	0	0	0	9	14	4	0	27
UP OR OUT	0	2	4	16	3	3	0	0	28
SPECIAL TOUR									
•ASSIGNMENTS• MOVES TO	0	0	0	0	0	0	0	0	0
TRANSFER FROM	0	0	0	0	0	0	C	0	0
•LOSSES• TOTAL	0	0	0	0	0	0	0	0	0
NON-REENLISTMENT	0	0	0	0	0	0	0	0	0
EXCEPTIONAL ATTRITION	0	0	0	0	0	0	0	0	0
EARLY OUT	0	0	0	0	0	0	0	0	0
UP OR OUT	0	0	0	0	0	0	0	0	0
ACCOMPANIED TOUR									
•ASSIGNMENTS• MOVES TO	39	154	223	533	574	523	32	0	2078
TRANSFER FROM	95	98	267	389	617	333	83	0	1882
•LOSSES• TOTAL	31	56	127	158	108	185	46	0	711
NON-REENLISTMENT	31	52	115	126	100	151	32	0	607
EXCEPTIONAL ATTRITION	0	1	5	3	4	3	0	0	16
EARLY OUT	0	0	0	0	0	19	11	0	30
UP OR OUT	0	3	7	29	4	12	3	0	58
CONUS TOUR									
•ASSIGNMENTS• MOVES TO	139	232	519	644	785	348	85	0	2752
TRANSFER FROM	53	354	561	1011	645	591	21	0	3236
•LOSSES• TOTAL	235	121	476	497	579	950	774	8	3640
NON-REENLISTMENT	234	109	440	431	533	920	737	0	3404
EXCEPTIONAL ATTRITION	1	2	9	11	18	9	16	6	72
EARLY OUT	0	0	0	0	0	0	0	0	0
UP OR OUT	0	10	27	55	28	21	21	2	164
DUE TO CONUS OVERAGE	0	0	0	0	0	0	0	0	0
TOTAL BY GRADE									
•ASSIGNMENTS• MOVES TO	194	593	1096	1777	1537	1185	136	0	6518
TRANSFER FROM	194	593	1096	1777	1537	1185	136	0	6518
•LOSSES• TOTAL	271	218	671	725	726	1205	834	8	4658
NON-REENLISTMENT	270	200	618	611	659	1124	779	0	4261
EXCEPTIONAL ATTRITION	1	3	15	14	23	12	16	6	90
EARLY OUT	0	0	0	0	9	33	15	0	57
UP OR OUT	0	15	38	100	35	36	24	2	250
DUE TO CONUS OVERAGE	0	0	0	0	0	0	0	0	0
PROMOTION SUMMARY									
TOTAL	0	153	230	274	179	394	208	3329	4767

CAROM CAROM RUN ON 73XXX(TEST) DATE 78/07/ PAGE 31

MANNING LEVEL REPORT SIMULATION TIME PERIOD 41

TOUR CATEGORY	SKILL 9	SKILL 8	SKILL 7	SKILL 6	SKILL 5	SKILL 4	SKILL 3	SKILL 1/2	TOTAL BY TOUR
REMOTE TOUR									
ACTUAL	176	0	263	0	125	0	0	0	564
AUTHORIZED	176	0	263	0	125	0	50	0	614
OVERAGE (- IF SHORTAGE)	0	0	0	0	0	0	-50	0	-50
PER CENT FILLED FROM SKILLS BELOW	.0	.0	.0	.0	.0	.0	.0	.0	
PER CENT FILLED FROM SKILLS ABOVE	.0	.0	.0	.0	.0	.0	.0	.0	
PER CENT TOTAL SPACES FILLED	100.0	.0	100.0	.0	100.0	.0	.0	.0	
SPECIAL TOUR									
ACTUAL	0	0	0	0	0	0	0	0	0
AUTHORIZED	0	0	0	0	0	0	0	0	0
OVERAGE (- IF SHORTAGE)	0	0	0	0	0	0	0	0	0
PER CENT FILLED FROM SKILLS BELOW	.0	.0	.0	.0	.0	.0	.0	.0	
PER CENT FILLED FROM SKILLS ABOVE	.0	.0	.0	.0	.0	.0	.0	.0	
PER CENT TOTAL SPACES FILLED	.0	.0	.0	.0	.0	.0	.0	.0	
ACCOMPANIED TOUR									
ACTUAL	313	0	814	0	351	0	0	0	1478
AUTHORIZED	313	0	814	0	351	0	313	0	1791
OVERAGE (- IF SHORTAGE)	0	0	0	0	0	0	-313	0	-313
PER CENT FILLED FROM SKILLS BELOW	.0	.0	.0	.0	.0	.0	.0	.0	
PER CENT FILLED FROM SKILLS ABOVE	.0	.0	.0	.0	.0	.0	.0	.0	
PER CENT TOTAL SPACES FILLED	100.0	.0	100.0	.0	100.0	.0	.0	.0	
CONUS TOUR									
ACTUAL	1130	0	3137	0	4913	0	654	0	9834
AUTHORIZED	3759	0	3133	0	1667	0	1253	0	9812
OVERAGE (- IF SHORTAGE)	-2629	0	4	0	3246	0	-599	0	22
PER CENT FILLED FROM SKILLS BELOW	.0	.0	.0	.0	.0	.0	.0	.0	
PER CENT FILLED FROM SKILLS ABOVE	.0	.0	.0	.0	.0	.0	.0	.0	
PER CENT TOTAL SPACES FILLED	30.1	.0	88.9	.0	94.9	.0	37.4	.0	
TOTAL BY SKILL									
ACTUAL	1619	0	4214	0	5389	0	654	0	11876
AUTHORIZED	4248	0	4210	0	2143	0	1616	0	12217
OVERAGE (- IF SHORTAGE)	-2629	0	4	0	3246	0	-962	0	-341

ASSIGNMENT, LOSS AND PROMOTION REPORT   SUMMARY FOR TIME PERIODS 2 TO 41

NUMBER OF NEW ACCESSIONS 4360

TOUR CATEGORY	SKILL 9	SKILL 8	SKILL 7	SKILL 6	SKILL 5	SKILL 4	SKILL 3	SKILL 1/2	TOTAL BY TOUR
REMOTE TOUR									
•ASSIGNMENTS• MOVES TO	555	0	723	0	410	0	0	0	1688
TRANSFER FROM	445	0	660	0	295	0	0	0	1400
•LOSSES• TOTAL	112	0	111	0	84	0	0	0	307
NON-REENLISTMENT	105	0	82	0	63	0	0	0	250
EXCEPTIONAL ATTRITION	1	0	1	0	0	0	0	0	2
EARLY OUT	0	0	9	0	18	0	0	0	27
UP OR OUT	6	0	19	0	3	0	0	0	28
SPECIAL TOUR									
•ASSIGNMENTS• MOVES TO	0	0	0	0	0	0	0	0	0
TRANSFER FROM	0	0	0	0	0	0	0	0	0
•LOSSES• TOTAL	0	0	0	0	0	0	0	0	0
NON-REENLISTMENT	0	0	0	0	0	0	0	0	0
EXCEPTIONAL ATTRITION	0	0	0	0	0	0	0	0	0
EARLY OUT	0	0	0	0	0	0	0	0	0
UP OR OUT	0	0	0	0	0	0	0	0	0
ACCOMPANIED TOUR									
•ASSIGNMENTS• MOVES TO	401	0	1100	0	577	0	0	0	2078
TRANSFER FROM	429	0	1030	0	423	0	0	0	1882
•LOSSES• TOTAL	198	0	281	0	232	0	0	0	711
NON-REENLISTMENT	182	0	241	0	184	0	0	0	607
EXCEPTIONAL ATTRITION	6	0	7	0	3	0	0	0	16
EARLY OUT	0	0	0	0	30	0	0	0	30
UP OR OUT	10	0	33	0	15	0	0	0	58
CONUS TOUR									
•ASSIGNMENTS• MOVES TO	860	0	1452	0	440	0	0	0	2752
TRANSFER FROM	942	0	1585	0	709	0	0	0	3236
•LOSSES• TOTAL	802	0	1093	0	1738	0	7	0	3640
NON-REENLISTMENT	754	0	982	0	1668	0	0	0	3404
EXCEPTIONAL ATTRITION	11	0	28	0	26	0	7	0	72
EARLY OUT	0	0	0	0	0	0	0	0	0
UP OR OUT	37	0	83	0	44	0	0	0	164
DUE TO CONUS OVERAGE	0	0	0	0	0	0	0	0	0
TOTAL BY SKILL									
•ASSIGNMENTS• MOVES TO	1816	0	3275	0	1427	0	0	0	6518
TRANSFER FROM	1816	0	3275	0	1427	0	0	0	6518
•LOSSES• TOTAL	1112	0	1485	0	2054	0	7	0	4658
NON-REENLISTMENT	1041	0	1305	0	1915	0	0	0	4261
EXCEPTIONAL ATTRITION	18	0	36	0	29	0	7	0	90
EARLY OUT	0	0	9	0	48	0	0	0	57
UP OR OUT	53	0	135	0	62	0	0	0	250
DUE TO CONUS OVERAGE	0	0	0	0	0	0	0	0	0
PROMOTION SUMMARY									
TOTAL	0	0	759	0	1196	0	3939	0	5894

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